CLAIMS

1. A method of manufacturing ferromagnetic particle exothermic elements for performing a deposition treatment for causing a treating aqueous solution containing fluorine and iron to contact nucleus particles, to deposit iron hydroxide and form layers around the nucleus particles, and an after-treatment for heating the iron hydroxide layers to change them into ferromagnetic layers, thereby producing ferromagnetic particle exothermic elements with outside of said nucleus particles covered by said ferromagnetic layers,

   wherein, in time of said deposition treatment, a reaction initiator that reacts with hydrogen fluoride is added to said treating aqueous solution.

2. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 1, wherein said reaction initiator is added to said treating aqueous solution successively as the time of said deposition treatment passes.

3. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 2, wherein said reaction initiator is added in small quantities at early stages of deposition of said iron hydroxide, and in increased quantities afterward.

4. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 3, wherein a hydrogen ion concentration (pH) in the treating aqueous solution and a molar concentration ratio (X) of fluorine to iron in the treating aqueous solution before addition of said reaction initiator satisfy relations $pH \leq 3.5$ and $X \leq 4$.

5. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 3, wherein a hydrogen ion concentration (pH) in the treating aqueous solution before

addition of said reaction initiator and a molar concentration of iron (Y) in the treating aqueous solution after addition of said reaction initiator satisfy relations $3.5<pH<6$ and $0.001 \leq Y \leq 0.5$.

6. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 4 or 5, wherein said treating aqueous solution has, dissolved therein, one or more iron raw materials selected from FeF_3, FeF_2, Fe_2F_5, $FeF_3 \cdot 3H_2O$, $FeF_3 \cdot 4.5H_2O$, $FeCl_2$, $FeCl_2 \cdot 4H_2O$, $FeCl_3$, $FeCl_3 \cdot 6H_2O$, $Fe(ClO4)_2 \cdot 6H_2O$, $Fe(ClO_4)_3 \cdot 6H_2O$, $FeBr_2$, $FeBr_2 \cdot 6H_2O$, $FeBr_3$, $FeBr_3 \cdot 6H_2O$, FeI_2, $FeI_2 \cdot 4H_2O$, FeO, Fe_2O_3, Fe_3O_4, $Fe(OH)_2$, FeOOH, $FeSO_4 \cdot 7H_2O$, $Fe_2(SO_4)_3 \cdot 9H_2O$ and Fe.

7. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 6, wherein said treating aqueous solution has, dissolved therein, one or more iron raw materials selected from FeF_3, FeF_2, Fe_2F_5, $FeF_3 \cdot 3H_2O$ and $FeF_3 \cdot 4.5H_2O$.

8. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 7, wherein said treating aqueous solution is prepared by dissolving said iron raw material in hydrofluoric acid.

9. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 7, wherein said treating aqueous solution is prepared by dissolving said iron raw material in a mixed solution of hydrofluoric acid and an ammonium fluoride aqueous solution.

10. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 8, wherein said reaction initiator comprises one or more additives selected from H_3BO_3, $FeCl_2$, $FeCl_3$, NaOH, NH_3, Al, Ti, Fe, Ni, Mg, Cu, Zn, Si, SiO_2, CaO, B_2O_3, Al_2O_3 and MgO.

11. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 9, wherein said reaction initiator comprises one or more additives selected from H_3BO_3, $FeCl_2$, $FeCl_3$, NaOH, NH_3, Al, Ti, Fe, Ni, Mg, Cu, Zn, Si, SiO_2, CaO, B_2O_3, Al_2O_3 and MgO.

12. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 10, wherein said reaction initiator comprises H_3BO_3.

13. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 11, wherein said reaction initiator comprises H_3BO_3.

14. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 12, wherein said after-treatment is carried out to form gamma hematite layers as the ferromagnetic layers by heating in an inert atmosphere or reducing atmosphere.

15. A method of manufacturing ferromagnetic particle exothermic elements as defined in claim 13, wherein said after-treatment is carried out to form gamma hematite layers as the ferromagnetic layers by heating in an inert atmosphere or reducing atmosphere.